5. LEVERAGES

PROBLEM NO: 1

Income statement

Particulars	Amount (Rs. In lakhs)
Sales	40
(-) Variable cost	(25)
Contribution	15
(-) Fixed cost	(6)
EBIT	9
(-)Interest	(3)
EBT	6

I) Operating leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{15\,\text{lakhs}}{9\,\text{lakhs}} = 1.67$ times

II) Financial leverage = $\frac{\text{EBIT}}{\text{EBT}} = \frac{9\,\text{lakhs}}{6\,\text{lakhs}} = 1.5$ times

PROBLEM NO: 2

From the given information

EBIT = 10 lakhs

Fixed cost = 20 lakhs

We know that

Contribution = EBIT + FIXED COST

= 10 lakhs + 20 lakhs

= 30 lakhs

From the given information EBT = Rs.8,00,000

We know that

Combined leverage = $\frac{\text{Contribution}}{\text{EBT}} = \frac{30\,\text{Lakhs}}{8\,\text{Lakhs}} = 3.75$ times

PROBLEM NO: 3

Particulars	Company A	Company B
i) Selling Price P.U	30	250
ii) Variable cost per unit	10	75
iii) Contribution P.U (i-ii)	20	175
iv) Sales units	60,000	15,000
v) Total contribution	12,00,000	26,25,000
vi) Fixed cost	7,00,000	14,00,000
vii) EBIT (v-vi)	5,00,000	12,25,000
viii) Interest (vii-viii)	48,000	78,000
ix) EBT	4,52,000	11,47,000
x) Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{12,00,000}{5,00,000}$ =2.4 times	$\frac{26,25,000}{12,25,000}$ = 2.14 times
xi) Financial leverage = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{5,00,000}{4,52,000}$ = 1.11 times	$\frac{12,25,000}{11,47,000}$ = 1.07 times
xii) Combined leverage = OL x FL	2.4 x 1.11 = 2.664 times	2.14 x 1.07 = 2.289 times

PROBLEM NO: 4

Particulars	P	Q	R
Selling Price P.U	7.50	7.00	10.00
Less: Variable cost per unit	(5.00)	(2.00)	(7.50)
Contribution per unit	2.50	5.00	2.50
No of units	2,50,000	1,25,000	7,50,000
Total contribution	6,25,000	6,25,000	18,75,000
Less: Fixed Cost	(5,00,000)	(2,50,000)	(10,00,000)
EBIT	**1,25,000**	**3,75,000**	**8,75,000**
Less: Interest	(75,000)	(25,000)	-
EBT	**50,000**	**3,50,000**	**8,75,000**
Operating leverage $\left(\frac{\text{contribution}}{\text{EBIT}}\right)$	$\frac{6,25,000}{1,25,000} = 5$	$\frac{2,50,000}{3,75,000} = 1.67$	$\frac{18,75,000}{8,75,000} = 2.14$
Financial leverage $\left(\frac{\text{EBIT}}{\text{EBT}}\right)$	$\frac{1,25,000}{50,000} = 2.5$	$\frac{3,75,000}{3,50,000} = 1.07$	$\frac{8,75,000}{8,75,000} = 1.00$
Combined leverage (OL x FL)	5 x 2.5 = 12.5	1.67 x 1.07 = 1.79	2.14 x 1.00 = 2.14
Conclusion:	Aggressive policy	Moderate Policy	Moderate policy with no financial leverage

PROBLEM NO: 5

Particulars	A	B	C
Sales (W.N-2)	3,600	8,000	12,000
(-) Variable cost (B / F)	(2,400)	(6,000)	(6,000)
Contribution	1,200	2,000	6,000
(-) Fixed Cost (B / F)	(900)	(1,600)	(4,000)
EBIT (W.N-1)	300	400	2,000
(-) Interest	(200)	(300)	(1,000)
EBT (W.N-1)	100	100	1,000
(-) Tax	(45)	(45)	(450)
EAT	55	55	550

WORKING NOTE-1: Calculation of EBIT and Contribution

Particulars	A	B	C
Degree of financial Leverage (DFL)	3:1	4:1	2:1
$\frac{\text{EBIT}}{\text{EBT}} = \frac{\text{EBT}+\text{INT}}{\text{EBT}} = \text{DPL}$	$\frac{\text{EBT}+200}{\text{EBT}} = 3$	$\frac{\text{EBT}+300}{\text{EBT}} = 4$	$\frac{\text{EBT}+1000}{\text{EBT}} = 2$
	3EBT-EBT=200	4EBT-EBT=300	2EBT-EBT=1000
	EBT=100	EBT=100	EBT=1000
EBIT=EBT+INT (A)	100+200=300	100+300=400	1000+1000=2000
Degree of operating leverage (DOL)	4:1	5:1	3:1
$\frac{\text{contribution}}{\text{EBIT}} = \text{DOL}$	$\frac{x}{300} = 4$	$\frac{x}{400} = 5$	$\frac{x}{2000} = 3$
Contribution (x) (B)	1200	2000	6000

WORKING NOTE-2: Calculation of sales

Particulars	A	B	C
Given Vc As a % of sales	66%	75%	50%
$\frac{\text{Contribution}}{\text{Sales}}$	34%	25%	50%

Contribution	1200	2000	6000
Sales	3600 $\left(\frac{1200}{34\%}\right)$	8000 $\left(\frac{2000}{25\%}\right)$	1200 $\left(\frac{6000}{50\%}\right)$

PROBLEM NO: 6

Particulars	Situation A		Situation B	
	Plan XY	Plan XM	Plan XY	Plan XM
Selling price p.u	30	30	30	30
Variable cost p.u	(20)	(20)	(20)	(20)
Contribution per unit	10	10	10	10
Sales (units)	6,000	6,000	6,000	6,000
Total Contribution	60,000	60,000	60,000	60,000
Fixed Cost	(20,000)	(20,000)	(25,000)	(25,000)
EBIT	40,000	40,000	35,000	35,000
Interest (W.N)	(4,800)	(1,200)	(4,800)	(1,200)
EBT	35,200	38,800	30,200	33,800
DOL = $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{60,000}{40,000}$ = 1.5	$\frac{60,000}{40,000}$ = 1.5	$\frac{60,000}{35,000}$ = 1.71	$\frac{60,000}{35,000}$ = 1.71
DFL = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{40,000}{35,200}$ = 1.14	$\frac{40,000}{38,800}$ = 1.03	$\frac{35,000}{30,200}$ = 1.16	$\frac{35,000}{33,800}$ = 1.04
DCL = OL X FL	1.5 x 1.14 = 1.71	1.5 x 1.03 = 1.545	1.71 x 1.16 = 1.984	1.71 x 1.04 = 1.778

WORKING NOTE: Interest Calculation

Plan XY = 40,000 x 12% = 4,800

Plan XM = 10,000 x 12% = 1,200

PROBLEM NO: 7

Income Statement

Particulars	Amount
Sales	6,00,000
Less: Variable cost @ 40%	(2,40,000)
Contribution @ 60%	3,60,000
Less: Fixed Cost	(1,00,000)
EBIT	2,60,000
Less: Interest (80,000 x 10%)	(8,000)
EBT	2,52,000

$$DOL = \frac{\text{Contribution}}{\text{EBIT}} = \frac{3,60,000}{2,60,000} = 1.38$$

$$DFL = \frac{\text{EBIT}}{\text{EBT}} = \frac{2,60,000}{2,52,000} = 1.03$$

DCL = OL X FL = 1.38 x 1.03 = 1.42

WORKING NOTES: Calculation of total sales from the given information

Total Assets = 2,00,000

Assets Turnover ratio = 3

We know that

$$\text{Asset Turnover ratio} = \frac{\text{Sales}}{\text{Assets}}$$

$$3 = \frac{\text{Sales}}{2,00,000}$$

∴ Total Sales = 6,00,000/-

Note: Income tax rate is irrelevant

PROBLEM NO: 8

Part – I **Same as problem 7**

Part – II **Calculation of level of EBIT**

Particulars	If EPS = 1	If EPS = 3	If EPS = 0
EBIT (B / F)	17,230	35,692	8,000
(-) Interest (80,000 x 10%)	(8,000)	(8,000)	(8,000)
EBT	9,230	27,692	0
(-) Tax @ 35%	(3,230)	(9,692)	0
EAT/EAESH	**6,000**	**18,000**	**0**
No. of equity shares	6,000	6,000	6,000
EPS	1	3	0

PROBLEM NO: 9

Income statement

Particulars	Amount (Rs)
Sales (W.N)	1,20,00,000
Less: Variable cost @ 60%	72,00,000
Contribution @ 40%	48,00,000
Less: Fixed cost	28,00,000
EBIT	20,00,000
Less: Interest (28,00,000 x 15%)	(4,20,000)
EBT	15,80,000
Tax @ 30%	(4,74,000)
EAT / EAESH	11,06,000
No of Equity shares	1,00,000

i) $EPS = \frac{EAESH}{no.of\ Equity\ shares} \frac{11,06,000}{1,00,000} = 11.06$

ii) Combine leverage $= \frac{Contribution}{EBT} = \frac{48,00,000}{15,80,000} = 3.04$

WORKING NOTE:

Calculation of sales

Total Assets = 30,00,000 + 18,00,000 = 48,00,000

Assets Turnover ratio $= \frac{Sales}{Total\ Assets} = 2.5$

Sales = Total Assets x 2.5

= 48,00,000 x 2.5

= 120,00,000

PROBLEM NO: 10

Income statement

Particulars	Amount (Rs)
Sales	75,00,000
Less: Variable cost (56% of 75,00,000)	42,00,000
Contribution	33,00,000
Less: Fixed cost	6,00,000

EBIT	27,00,000
Less: Interest @ 9% on Rs.45,00,000	4,05,000
EBT	22,95,000

a) ROI $= \frac{EBIT}{Capital\ Employed} \times 100$

$= \frac{EBIT}{Equity + Debt} \times 100$

$= \frac{27,00,000}{55,00,000 + 45,00,000} \times 100$

$= 27\%$

b) ROI = 27% and interest on debt is 9%

Hence it has a favorable financial leverage

c) Capital Turn over $= \frac{Net\ Sales}{Capital\ employed}$

$= \frac{75,00,000}{100,00,000} = 0.75$

Which is very low as compared to industry average 3.

d) Calculation of leverages

i) Operating leverage $= \frac{Contribution}{EBIT} = \frac{33,00,000}{27,00,000} = 1.22$ times

ii) Financial leverage $= \frac{EBIT}{EBT} = \frac{27,00,000}{22,95,000} = 1.18$ times

iii) Combined leverage $= \frac{Contribution}{EBT} = \frac{33,00,000}{22,95,000} = 1.44$ times

e) Operating leverage is 1.22. So is sales increased by 10% EBIT will increased by 1.22 x 10% = 12.20%.

f) Operating leverage = 1.22

If sales drop to Rs.50,00,000 i.e. reduced by 33.33% $\left(\frac{75L - 50L}{75L} x100\right)$

1% change in sales = 1.22% change in EBIT

33.33% change in sales = 1.22 x 33.33 = 40.667 % change in EBIT

EBIT will also decrease by 40.667%

$\therefore$ Proposed EBIT = 27,00,000×(100% - 40.667%)

= 16,01,991

g) EBT of firm will be equal to zero

EBT = 0

EBIT – Int = 0

EBIT = Interest

Contribution – Fixed Cost = Interest

Since VC = 56% of Sales

44% of sales = Interest + Fixed cost

$Sales = \frac{Interest + Fixed\ Cost}{44\%}$

$= \frac{4,05,000 + 6,00,000}{44\%} = Rs.22,84,091$

$\therefore$ At Sales level of Rs.22,84,091, EBT becomes Zero.

PROBLEM NO: 11

i) Net sales = 30 crores
EBIT =12% on sales = 3.6 crores

Return on capital employed (pre-tax) = $\frac{EBIT}{Capital Employed} = \frac{3.6}{10 + 2 + 6} x100 = 20\%$

(ESC + PSC + Debt)

After tax it will be = 20% (1 -.04) =12%

Particulars	Amount in Crores
EBIT	3.6
Less: Interest on debt (15% of 6 Crores)	(0.9)
EBT	2.7
Less: Tax @ 40%	(1.08)
EAT	1.62
Less: Preference Dividend	(0.26)
EAESH	1.36
Capital Employed	10

Return on equity = $\frac{EAESH}{cap.emp.} x100 = \frac{1.36}{10} x100 = 13.6\%$

Segments due to presence of preference share capital and borrowings
Segment of ROE due to preference capital = (12%-13%) x 2 = - 2%
Segment of ROE due to debentures = (12% - 9%) x 6 = 18 %
Total (-2% +18%) = 16 %
Cost of debentures (after tax) = 15% (1-0.4) = 9%

The WACC

Source	Proportions	Cost %	WACC
Equity	10/18	13.60	7.56
Preference	2/18	13.00	1.44
Debt	6/18	9.00	3.00
			12.00

ii) Financial leverage = $\frac{EBIT}{EBT} = \frac{3.6}{2.7} = 1.33$ times

Combined leverage = 3 times

Operating leverage = $\frac{CL}{FL} = \frac{3}{1.33} = 2.26$

THE END